

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW MEXICO

UNITED STATES OF AMERICA,

Plaintiff,

v.

CR No. 16-1701 JCH

AARON MERCADO-GRACIA,

Defendant.

MEMORANDUM OPINION AND ORDER

THIS MATTER comes before the Court on Defendant Aaron Mercado-Gracia's request for a pretrial *Daubert* hearing, set forth in his Response in Opposition to Government's Notice of Intention to Offer Expert Testimony (ECF No. 113). In his Response to United States' Motion to Reconsider *Daubert* Hearing (ECF No. 133), Defendant asserts that Douglas Lloyd should not be allowed to testify as an expert. The Court held a *Daubert* hearing regarding the testimony of Douglas Lloyd ("Lloyd") on October 29, 2018. The Court, having considered the briefs, record, evidence, testimony at the hearing, applicable law, and otherwise being fully advised, concludes that Defendant's request to exclude the expert testimony of Douglas Lloyd concerning fingerprint identification evidence under *Daubert* and Rule 702 will be denied.

I. BACKGROUND

The Government intends to prove the following facts at trial. On March 25, 2016, New Mexico State Police ("NMSP") Canine Officer Ronald Wood was traveling westbound on Interstate-40 with his drug detection dog Arras when he observed a silver Dodge Charger traveling

eastbound on I-40 seemingly driving faster than the posted 75 miles per hour speed limit. Mem. Op. and Order 1-3, ECF No. 107. During the encounter, Officer Wood developed reasonable suspicion that the driver, Defendant, may be engaged in criminal activity. *See id.* at 14-19. Officer Wood detained Defendant and used his drug detection dog Arras to conduct a dog sniff of the outside of the car, during which Arras alerted to the vehicle. *See id.* at 9-11, 20-21. Officer Wood and another sergeant searched the interior of the car driven by Defendant where they found two large bundles of heroin and a firearm. *Id.* at 12. The United States subsequently charged Defendant in a two-count Indictment (ECF No. 12) with Possession with Intent to Distribute 1 Kilogram and More of Heroin under 21 U.S.C. §§ 841(a)(1) and (b)(1)(A) and Using and Carrying a Firearm During and in Relation to a Drug Trafficking Crime and Possessing a Firearm in Furtherance of Such Crime under 18 U.S.C. § 924(c).

On April 12, 2016, Deputy United States Marshal Justin Villareal obtained Defendant's fingerprints as part of a routine booking process. *See* United States' Opposed Mot. to Compel 1, ECF No. 127. Lloyd and Thomas Handley ("Handley") work for the Department of Homeland Security Laboratories and Scientific Services as forensic scientists for latent print analysis. *See* Notice of Intent to Call Expert Witnesses Douglas Lloyd and Thomas Handley on Latent Print Analysis 1, ECF No. 65. The Government proffers that Handley will testify that he processed the firearm and magazines seized in this case for latent prints using a process called Cyanoacrylate fuming ("CAE"). *See id.* at 2; Supp. Notice 7, ECF No. 126. CAE fuming involves heating a superglue to become gaseous, producing a polymer that adheres to the residue on a fingerprint. Supp. Notice 7, ECF No. 126. Handley heat vaporized the superglue under negative pressure in a vacuum chamber. *Id.* He then stained the prints using a fluorescent dye called Rhodamine 6G to better visualize them under laser light. *Id.* Using filters and fluorescent laser light, Handley

examined and photographed the print glow. *Id.* at 7-8. He copied the images and stored the images for use by a latent print examiner. *Id.* at 8.¹

The Government further proffers that Lloyd viewed the images from Handley and determined that two of the eight images had sufficient value for further analysis using the ACE-V methodology. *See id.* at 9. Lloyd is expected to testify that he viewed the digital images photographed by Handley, compared them to Defendant's fingerprint images, and identified fingerprints of value 4A and 5A as the right thumb and right index finger of Defendant. *See id.* at 11. Defendant requests that Douglas Lloyd not be allowed to testify in this case as an expert. Def.'s Resp. 5, ECF No. 133.

II. Latent Fingerprint Identification

A latent print is an unintentional reproduction of the friction skin found on the palmer side of the hand. Hr'g Tr. 14:23-25. Friction skin is the raised skin of the fingers and palms. *See id.* at 15:7-16:4. Sweat pores in the skin emit oils, water, and chemicals; the latent print is the debris from the sweat pores left on a surface. *See id.* Latent prints are processed using a powder or chemicals to reveal the print. *See id.* A known, or standard, print is the intentional reproduction of ridge endings of the fingers or palms by placing a small amount of ink on the ridges and applying it to a contrasting background such as a white card. *See id.* at 15:25-16:9.

For a latent print to have value to a latent print examiner, it must have certain levels of characteristics for use in the ACE-V method of analysis. *See id.* at 16:25-17:7. ACE-V stands for analysis, comparison, evaluation, and verification. *See Hr'g Tr. 27:10-16; United States v. Herrera*, 704 F.3d 480, 484 (7th Cir. 2013). The ACE-V method has been described as follows:

¹ Although Defendant initially challenged the admissibility of Handley's testimony under *Daubert*, at the October 24, 2018 status conference, defense counsel withdrew her request for a *Daubert* hearing as to Handley's testimony.

The process begins with the analysis of the unknown friction ridge print (now often a digital image of a latent print). Many factors affect the quality and quantity of detail in the latent print and also introduce variability in the resulting impression.... If the examiner deems that there is sufficient detail in the latent print (and the known prints), the comparison of the latent print to the known prints begins.

Visual comparison consists of discerning, visually “measuring,” and comparing—within the comparable areas of the latent print and the known prints—the details that correspond. The amount of friction ridge detail available for this step depends on the clarity of the two impressions. The details observed might include the overall shape of the latent print, anatomical aspects, ridge flows, ridge counts, shape of the core, delta location and shape, lengths of the ridges, minutia location and type, thickness of the ridges and furrows, shapes of the ridges, pore position, crease patterns and shapes, scar shapes, and temporary feature shapes (e.g., a wart).

At the completion of the comparison, the examiner performs an evaluation of the agreement of the friction ridge formations in the two prints and evaluates the sufficiency of the detail present to establish an identification (source determination). Source determination is made when the examiner concludes, based on his or her experience, that sufficient quantity and quality of friction ridge detail is in agreement between the latent print and the known print. Source exclusion is made when the process indicates sufficient disagreement between the latent print and known print. If neither an identification nor an exclusion can be reached, the result of the comparison is inconclusive. Verification occurs when another qualified examiner repeats the observations and comes to the same conclusion, although the second examiner may be aware of the conclusion of the first.

Herrera, 704 F.3d at 484 (quoting National Research Council of the National Academy of Sciences, *Strengthening Forensic Science in the United States: A Path Forward* 137–38 (2009)). See also Hr’g Tr. 27:10-66:9. Often, an examiner will compare the latent and known prints using Photo Shop, a widely used computer program that allows an examiner to capture the print images, put images side-by-side, and enhance the coloring of the print and make markings. See Hr’g Tr. 17:18-18:2.

III. ANALYSIS

The Supreme Court has held that trial courts have a gatekeeping responsibility to “ensure

that any and all scientific testimony or evidence admitted is not only relevant, but reliable.” *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 589 (1993). In *Daubert*, the Supreme Court provided a list of specific factors bearing on reliability that trial courts could consider in executing the gatekeeping obligation. *See id.* at 592-93. These so-called *Daubert* factors can be summarized as follows: (1) whether a theory or technique has been or can be tested; (2) whether the theory or technique has been subjected to peer review and publication; (3) the technique’s known or potential rate of error and the existence and maintenance of standards controlling the technique’s operation; and (4) whether a particular technique or theory has gained general acceptance in the relevant scientific community. *See id.* at 593-94. However, the *Daubert* Court did not “presume to set out a definitive checklist or test,” recognizing instead that “[m]any factors” might bear on the Rule 702 inquiry. *Id.* at 593.

In *Kumho Tire Co., Ltd., v. Carmichael*, 526 U.S. 137 (1999), the Supreme Court addressed “how *Daubert* applies to the testimony of engineers and other experts who are not scientists.” *Id.* at 141. The Supreme Court clarified that the “gatekeeping” obligation applied “not only to testimony based on ‘scientific’ knowledge, but also to testimony based on ‘technical’ and ‘other specialized’ knowledge.” *Id.* Trial courts considering the reliability of the testimony of non-scientists may consider the *Daubert* factors, but they are not required to do so because the “list of factors was meant to be helpful, not definitive.” *Id.* at 151. “[T]he test of reliability is ‘flexible,’ and *Daubert*’s list of specific factors neither necessarily nor exclusively applies to all experts or in every case.” *Id.* at 141. The law instead grants a court the same broad latitude when it decides how to determine reliability as it enjoys with the ultimate reliability determination. *Id.* at 142.

In *United States v. Baines*, 573 F.3d 979 (10th Cir. 2009), the Tenth Circuit explained that fingerprint identification evidence may not be strictly “scientific” in the *Daubert* sense, but that

neither *Daubert*, *Kumho Tire*, nor Rule 702 require scientific purity for admissibility. *See id.* at 989. Instead, Rule 702 permits flexibility in determining the reliability of expert testimony based on experience or technical knowledge:

We also remain mindful that *Daubert* addressed evidence that was claimed to be scientific. *Kumho Tire* held that the trial court's gatekeeping function applies to all expert testimony and noted that there is no clear line separating "scientific" knowledge from technical knowledge or knowledge based on experience. Nonetheless, the Court there said that "*some of Daubert's* questions can help to evaluate the reliability even of experience-based testimony," 526 U.S. at 151, 119 S.Ct. 1167 (emphasis added), strongly suggesting that the Court realized that some of the *Daubert* factors may be less helpful when the evidence under consideration is not scientific in the strict sense. Although the importance of the distinction is thus uncertain, we agree with the Third Circuit that fingerprint analysis is best described as an area of technical rather than scientific knowledge.

Id. at 989-90.

In its current form following amendments in response to *Daubert* and its progeny, Rule 702 provides:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Crim. P. 702 & Advisory Committee Notes, 2000 Amendments. The focus of the Rule 702 inquiry "must be solely on principles and methodology, not on the conclusions that they generate." *Daubert*, 509 U.S. at 595.

A. *Daubert* Factors

1. Whether the Theory Can be Tested

Research on the persistence and uniqueness of fingerprints has occurred over hundreds of years. *See Hr’g Tr.* 19:22-26:3. In 1687, Marcello Malpighi published works concerning how friction ridges are formed at different levels during pregnancy, and by the end of the 14-week period, the fingerprint ridges are usually formed to a point where they would make a fingerprint. *See id.* at 21:3-13. His and other studies showed the embryonic development of ridges form configurations that continue permanently. *See id.* at 21:3-25. Studies conducted by Dr. Welker in 1859, by Dr. Herschel in 1916, and by Dr. Evin showed the long-term permanency of friction ridge impressions of different individuals over time. *See id.* at 22:1-23:9. Other studies have focused on the qualitative and quantitative processes used in analyzing the different characteristics of individual fingerprints. *See id.* at 24:6-13 (discussing Sir Francis Galton’s 1890 published papers on different characteristics, or Galton points, of fingerprints), *id.* at 24:14-22 (explaining Dr. Wentworth and Wilder published studies on whether identifiable characteristics observed in one print should be observed again and again no matter how many times one takes that print), *id.* at 24:23-25:8 (noting studies by David Ashbaugh on ACE-V methodology), *id.* at 35:5-15 (explaining 2009 study called Qualitative Assessment of Skin Deformation, A Pilot Study from the Journal of Forensic Identification by Alice Maceo regarding effect of pressure on print characteristics), *id.* at 36:5-9 (noting 1984 FBI Science of Fingerprint study researching cores and deltas). An identical twin study determined that even identical twins ultimately have unique fingerprints due to pressures from clinching or grabbing the fist in utero. *See id.* at 26:11-27:5. The Neumann study examined the relationship between the number of characteristics found in agreement and the ability to make a source identification. *See id.* at 60:20-62:4. Finally, studies regarding the accuracy of the performance of fingerprint examiners have been performed. *See Hr’g*

Tr. 85:16-87:11. *See also McCluskey*, 2013 WL 12329921, at *9-10 (citing studies). Continued studies are ongoing in the fingerprint community. *See* Hr’g Tr. at 26:6-10.

Numerous courts, including this one, have held that the ACE-V method can be tested. *See, e.g., Baines*, 573 F.3d at 990 (“the core proposition—that reliable identifications may be made from comparison of latent prints with known prints—is testable”); *United States v. Mitchell*, 365 F.3d 215, 235-36 (3d Cir. 2004) (concluding that hypotheses that human friction ridge arrangements are unique and permanent and that a positive identification can be made from fingerprints containing sufficient quantity and quality of detail are testable); *United States v. McCluskey*, CR. No. 10-2734 JCH, 2013 WL 12329921, at *7 (D.N.M. July 22, 2013) (“Several federal courts have held that the underpinnings of the ACE-V method are open to testing, and this Court agrees.”). Given the record and authority, the first *Daubert* factor weighs in support of admissibility. *Cf. Baines*, 573 F.3d at 990 (“And unquestionably the [ACE-V] technique has been subject to testing, albeit less rigorous than a scientific ideal, in the world of criminal investigation, court proceedings, and other practical applications, such as identification of victims of disasters. Thus, while we must agree with defendant that this record does not show that the technique has been subject to testing that would meet all of the standards of science, it would be unrealistic in the extreme for us to ignore the countervailing evidence.”).

2. Peer Review and Publication of the ACE-V Method

The record contains information on studies concerning the reliability of latent fingerprint analysis but contains less on the extent of peer review of the studies or the ACE-V method. This factor is thus neutral.

3. Known or Potential Error Rate

Defendant argues that fingerprint analysis is completely subjective and bias affects

fingerprint analysis results, citing publications in support. Additionally, defense counsel highlighted at the hearing that Lloyd was unaware of population statistics regarding the uniqueness of fingerprints. *See* Hr’g Tr. 78:13-79:22. Lloyd acknowledged that latent print examinations involve subjectivity, and human error can occur, notably in the comparison step of the ACE-V method. *See id.* at 79:14-15, 82:21-83:13.

Nevertheless, the training and experience of latent print analysts is important in the field of fingerprint analysis. *Id.* at 83:14-17. As noted *supra*, studies on the accuracy of latent print examinations have been conducted. In the Ulery study, 169 latent print examiners were given 100 prints, and the analysts made correct identifications 99.8% of the time. *See* Hr’g Tr. 85:16-25. The Ulery study found a false negative rate of 7.5%. *See id.* at 86:1-7. Numerous courts to have examined this issue have found that the error rate evidence in fingerprint identification weighs in favor of admissibility. *Cf. Baines*, 573 F.3d at 990-91 (noting “accumulated data is impressive” regarding ACE-V error rates and “known error rate remains impressively low” and concluding that evidence of error rate strongly supported judge’s decision to admit expert testimony); *Herrera*, 704 F.3d at 487 (observing that “errors in fingerprint matching by expert examiners appear to be very rare”) (citing Greg Hampikian, *et al.*, “The Genetics of Innocence: Analysis of 194 U.S. DNA Exonerations,” 12 *Annual Rev. of Genomics and Human Genetics* 97, 106 (2011)). The recent bias studies cited by Defendant indicate that the error rate could be higher in real world settings where bias may be introduced; however, the very low error rate in the controlled Ulery study favors admissibility.

4. Existence and Maintenance of Standards

The Customs and Border Patrol (“CBP”) laboratory is certified by an outside agency, the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (“ASCLD”).

Hr’g Tr. 67:11-68:16. ASCLD promulgates its own standards that the ASCLD-certified laboratories must follow. *See id.* at 68:10-69:3. Independent examiners from ASCLD analyze cases from the laboratory to make sure all laboratory analysts are following the same guidelines and the laboratory internal procedures and that the analysts all have the same training. *See id.* at 67:12-69:3. ASCLD and the fingerprint analysis community use the ACE-V process for latent print comparison. *See id.* at 69:4-12.

CBP latent print examiners throughout the world, including Douglas Lloyd, are certified by the International Association for Identification (“IAI”). *See id.* at 11:14-13:6, 66:10-15. Latent print examiners must pass a test issued by the IAI. *Id.* at 66:13-67:10. The IAI requires re-testing every five years and training within the five years to stay continually certified. *See id.* Failure to pass the IAI’s proficiency test will result in a six to twelve-month suspension, mandatory re-training, and re-testing. *See id.* at 80:23-81:14.

Although the ACE-V system is a procedural standard relying on the subjective judgment of the examiner, there are accepted standards for following the ACE-V method, training on the system, and certification processes within the fingerprint examiner community to help ensure quality. This factor therefore weighs in favor of admissibility.

5. General Acceptance of Theory

The IAI, a worldwide standard, follows the ACE-V methodology. *See id.* at 11:14-18, 67:12-69:12. Despite the subjectivity inherent in the ACE-V method and some studies suggesting bias can affect results, federal courts of appeals have consistently concluded that ACE-V is an acceptable and reliable methodology. *See, e.g., Herrera*, 704 F.3d at 486-87 (“Fingerprint experts ... receive extensive training; and errors in fingerprint matching by expert examiners appear to be very rare.... [t]hough the matching process is judgmental rather than scientifically rigorous because

it depends on how readable the latent fingerprint is and also on how distorted a version of the person's patent fingerprint it is. Examiners' training includes instruction on how to determine whether a latent print contains enough detail to enable a reliable matching to another print. Ultimately the matching depends on subjective judgments by the examiner, but responsible fingerprint matching is admissible evidence, in general and in this case.") (internal quotations and citations omitted); *United States v. Scott*, 403 F. App'x 392, 398 (11th Cir. Nov. 16, 2010) (unpublished) ("The ACE-V method has been in use for over 20 years, and is generally accepted within the community of fingerprint experts. Based on this information, the district court did not commit an abuse of discretion by concluding that fingerprint examination is a reliable technique."); *Baines*, 573 F.3d at 991 ("while we acknowledge that acceptance by a community of unbiased experts would carry greater weight, we believe that acceptance by other experts in the field should also be considered. And when we consider that factor with respect to fingerprint analysis, what we observe is overwhelming acceptance."); *United States v. Crisp*, 324 F.3d 261, 268-70 (4th Cir. 2003) (noting that fingerprint identification evidence bear imprimatur of strong general acceptance in expert community and in courts and holding that district court did not abuse its discretion by admitting expert testimony regarding fingerprint evidence because fingerprint evidence satisfies *Daubert*). The general-acceptance-in-the-community factor favors admissibility.

B. Rule 702

Douglas Lloyd has almost 20 years of experience in the field of latent print examination, first as a crime scene officer and later as a latent print examiner. *See* Hr'g Tr. 9:7-13:14. He was initially certified by the IAI after he passed the test in 2004, and he has been continuously certified since that time. *Id.* at 13:9-14. Additionally, he has been previously qualified in court as an expert in the field of latent print comparison. *Id.* at 13:17-24. He has over 320 hours of latent print

training. *Id.* at 10:11-12. The Court finds that Lloyd is qualified as an expert in the field of latent fingerprint analysis and identification by knowledge, skill, experience, training, and education.


His testimony would be helpful to the jury in understanding the fingerprint evidence, which requires specific education and training to understand and interpret. It is also relevant to important issues in the case, such as whether Defendant possessed the firearm.

Although not entirely scientific in nature, fingerprint analysis requires significant training and experience using a standard methodology. As *Kumho Tire* instructs, expert testimony on matters of a technical nature or related to specialized knowledge, albeit not scientific, can be admissible under Rule 702, so long as the testimony satisfies the Court's test of reliability and relevance. *See Kumho Tire*, 526 U.S. at 149. Fingerprint identification testimony is sufficiently reliable to be admitted into evidence at trial and Lloyd is qualified by his education, training, and experience to testify to matters in the field of fingerprint analysis and identification. The Court will therefore deny Defendant's motion to exclude Lloyd from testifying at trial.

Although the Government has proffered how Lloyd applied the ACE-V method to arrive at his conclusions in this case, the evidence at the hearing was limited to the ACE-V method generally. The Court is therefore unable on the evidentiary record before it to rule definitively on the Rule 702 factor of whether Lloyd "has reliably applied the principles and methods to the facts of the case." *See Fed. R. Crim. P. 702(d)*. The Court will reserve ruling until trial on the admissibility of Lloyd's expert opinions regarding the identification conclusions he made as to the fingerprints in this case. Should the evidence at trial follow the proffer, the Court will likely admit Lloyd's testimony concerning the fingerprint identification he made in this case.

IT IS THEREFORE ORDERED that Defendant's request to exclude the expert testimony of Douglas Lloyd concerning fingerprint identification evidence under *Daubert* and

Rule 702, as set forth in Defendant's Response in Opposition to Government's Notice of Intention to Offer Expert Testimony (**ECF No. 113**), is **DENIED**.


UNITED STATES DISTRICT JUDGE